Longlining in American Samoa—the Fleet and its Economics

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The American Samoa longline fleet expanded markedly in 2001. Prior to that, the fleet was comprised primarily of local catamaran alias (Figure 1a) targeting South Pacific albacore (Thunnus alalunga) *for the two canneries in American Samoa. The alias also caught bigeye tuna* (Thunnus obesus), *yellowfin tuna* (Thunnus albacares), *skipjack* (Katsuwonus pelamis), *dolphin* (Coryphaena hippurus), *and wahoo* (Acanthocybium solandri) *for the canneries, local markets and subsistence. Generally <30' in length, the alias take 1- to 3-day trips and have no or very limited modern technology.*

During 2001, 25 modern longline vessels, known locally and therefore referred to herein as "big boats," entered the fishery; there were only 3 active big boats in 2000 (Figure 1b). These vessels are >50' in length, and possess modern communications and other fish-finding technology. The big boats also have freezers (blast or brine), whereas the alias have limited fish storage and carry little ice. The sudden entrance of big boats into the fleet is reflected in an abrupt increase in the number of hooks set/year, as well as an increase in albacore catches (Figure 2).

Evolution of a Longline Fleet

The entrance of big boats into American Samoa's longline fleet has drawn considerable attention from fisheries managers, and a number of issues have arisen due to the increase in fleet size and capability. The Western Pacific Regional Fishery Management Council (WPRFMC) has classified these issues into three areas–avoiding gear conflicts, maintaining the potential for economically viable catch rates in the small-scale fishery, and maintaining cultural identity and dependence on ocean resources (WPRFMC 2000). A nearshore area closure has been implemented, and a limited entry system is being considered. It is hoped that these two management devices will prevent the issues from developing into problems.

Figures 1a and 1b. Typical American Samoa alia (top) and 'big boat' (below).

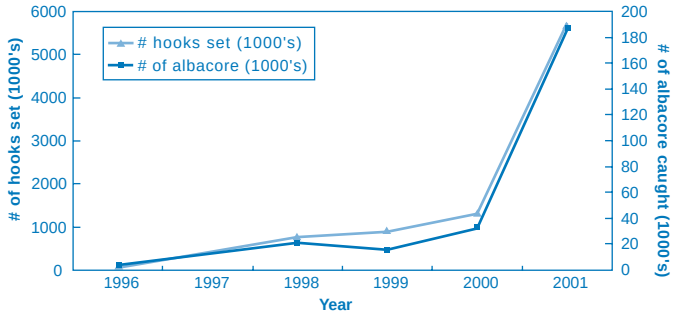

Figure 2. Annual number of hooks set (in 1000's) and number of albacore caught in the American Samoa longline fishery, 1996–2001.

The objectives of this study are to describe the big boats' physical characteristics, provide baseline economic information associated with operating the boats in the American Samoa longline fleet, and document fishers' opinions on specific management devices and other fisheries-related issues. This information is required by the Magnuson-Stevens Fishery Conservation and Management Act[1] to allow fisheries managers to consider the potential economic effects of future regulations.

Data Collection

Vessel owners, managers, or operators were personally interviewed at Pago Pago Harbor from December 5 through December 21, 2001; any vessel in port during this period was approached. Survey questions focused on variable costs (those incurred when a vessel actively fishes) and fixed costs (those incurred regardless of the number of trips a vessel takes) as well as vessel characteristics, demographics, and fishers' comments and preferences about future management alternatives.

Commercial fishing industry members were also interviewed, and they provided pertinent auxiliary information on the longline fleet. Commercial logbook information, including catch and effort, as well as vessel characteristics and activity, was provided by the National Marine Fisheries Service, Western Pacific Fisheries Information Network (WPacFIN— web site: http://wpacfin.nmfs.hawaii.edu/as/Data/Pages/as_data_main.htm).

Expenditures and Revenue Analysis

Only 5 of the 18 vessels included in the analysis fished in American Samoa throughout 2001. Based on logbook and vessel activity data from 3 of these vessels (the other 2 had not completed a full year of logbook reports) it was estimated that the average vessel could expect to make 17 trips a year if 14 sets were made each trip. To determine annual variable costs, the

[1]SEC. 303 Contents of Fishery Management Plans 16 U.S.C. 1853 95-354, 99-659, 101-627, 104-297. (a) Required Provisions. – Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery shall—(2) contain a description of the fishery, including,…the cost likely to be incurred in management, actual and potential revenues from the fishery…

variable cost information per trip (e.g., fuel, bait, ice) was multiplied by 17.

Because this is a developing fishery, a "break-even" estimation (the amount of landed fish needed to match expenses) is one method of determining the level of fishing effort necessary to sustain a big boat in American Samoa. This was estimated by calculating the amount of albacore (the primary target species) at average 2001 prices that would have to have been landed to match total 2001 costs. An analysis was conducted examining the break-even point at different albacore prices.

Results and Discussion

Interviews and Big-Boat Description

Twenty-two big boats, representing 79% of the fleet, were in Pago Pago Harbor between December 5 and December 21, 2001. Of those, 18 vessels, or 64% of the fleet, were willing to provide information via interviews; this represented an 82% response rate for the survey.

Vessels described herein as big boats are large modern longliners. Except for 2 vessels using icemakers, these vessels in American Samoa had or were in the process of installing either blast or brine freezers. They also used large hydraulic reels and monofilament mainline, and were equipped with radar, GPS, VHF, SSB, temperature sensors, autopilot and lineshooters. Specific physical and operating characteristics of the vessels are summarized in Table 1.

Table 1. Physical and operational characteristics of big boats in the American Samoa longline fleet.

Characteristic	Average	Standard Deviation	n
Vessel overall length (feet)	69.2	12.8	18
Vessel age (years)	16.3	9.4	18
Main engine size (horsepower)	457.0	199.6	15
Fuel capacity (gallons)	13,056.0	6,320.0	18
Fuel/day travel (gallons)	216.0	91.0	16
Cruising speed (knots)	8.4	1.3	18
Mainline length (miles)	42.0	11.0	17
Hooks/set	2,141.0	529.0	17

Annual Costs and Break-Even Points

Reported total costs were estimated at $28,228 per trip, and total annual costs at $479,857 (Table 2). Labor was the highest cost to the American Samoa longline owner; insurance was the highest individual fixed cost, and fuel was the highest variable cost.

Based on the average 2001 albacore price of $2,496/t ($1.13/lb) a vessel would have to have landed 424,651 lbs of albacore to meet average annual fishing costs of $479,857. Given an average weight of 45 lbs for albacore landed by the American Samoa longline fleet (WPacFIN), this means a vessel would have to have landed 9,437 albacore annually, or 555 albacore per trip (based on 17 trips per year), or 40 albacore per set (based on 14 sets/trip), or 0.019 albacore per hook (based on 2,141 hooks/set).

Table 2. The 2001 averages and standard deviations of the estimated annual revenue and fixed and variable costs of the American Samoa big boat longline fleet.

Income Statement	Average (US$)	Standard Deviation (US$)	n
Fixed Costs Total	**101,039**		
Capital costs	35,578	11,856	16
Insurance	26,533	10,515	15
Bookkeeping	1,609	1,443	11
Mooring	6,480	0	0
Overhaul	1,558	900	13
Dry dock	4,077	2,682	13
Daily maintenance	13,691	21,200	16
Other repairs in 2001	3,333	577	3
Misc. costs	8,180	3,643	10
Variable Costs Total*	**200,923**		
Fuel	73,314	44,969	16
Oil	5,085	3,588	14
Ice (for non-albacore catch)	10,090	4,165	10
Bait	60,318	21,582	16
Resupply fishing gear	29,378	21,706	16
Provisions	22,738	7995	16
Labor Costs Total	**177,895**		
Captain's share	68,421		
Crew share+	109,474		
Total Costs	**479,857**		

*Presented as estimated yearly costs if 17 trips were made

+Crew share consists of 5 crew members earning a 6, 5, 5, 4 and 3 shares.

Logbook information from 10 vessels indicates that an average of 13,036 albacore was caught in 2001; therefore, the fleet last year was likely operating above expenses. In addition, further analysis indicates that at the current (March 2002) price of $1,884/t, the fleet is barely meeting expenses and possibly only generating income through landings of incidental species. If the price continues to drop to $1,500/t the fleet will clearly be operating at a net loss (Table 3).

Fishers' Responses

In addition to economic queries, the owners and operators were asked open-ended questions about their vessels' plans and future management of the American Samoa longline fishery. Ten fishers responded to these questions.

Nearshore area closure: At the time of the interviews, WPRFMC was considering implementation of a nearshore area closure that would restrict longline vessels >50' in length from fishing within 50 nm of shore. Fishers were asked "Do you feel that the proposed nearshore area closure (waters <50 nm from shore are closed to vessels >50' in length) will positively or negatively affect your operations? Why?" Ten percent of those interviewed felt

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Table 3. Breakeven estimation at various cannery prices for albacore and the 2001 vessel landing averages. Needed amount and poundage are based on vessel costs of $479,857 annually.

Albacore Catch Needed to Meet Expenses	Albacore Price/Ton 2001 Avg. ($2,496)	March 2002 ($1,884)	$1,500	2001 Vessel Avg. (std) n=10
Poundage	424,651	564,536	685,509	586,611 (247,661)
Individual albacore*	9,437	12,545	15,234	13,036 (5,503)
Albacore/trip**	555	738	896	767 (324)
Albacore/set+	40	53	64	55 (23)
Albacore/hook++	0.019	0.025	0.030	0.026 (0.011)

*Based on average albacore weight of 45 lbs.
**Based on 17 trips/year.
+Based on 14 sets/trip.
++Based on 2,141 hooks/set.

the nearshore area closure would restrict the amount of available fishing area to the point of unavoidable gear conflicts among big boats. Another 10% felt a nearshore area closure was acceptable around the main island of Tutuila but did not feel the need to close the areas around Swain's Island and Rose Atoll. Forty percent had no opinion of this potential management device primarily because they do not fish within 50 nm of land. Ten percent felt it was too late already but they did not explain the reasoning behind this opinion. The remaining 30% indicated they would like to see a nearshore area closure, but it is important to note that these fishers said they have not fished within 50 nm of shore in the past, nor do they plan to do so in the future.

Limited entry: The WPRFMC is now considering implementation of a limited entry program for the American Samoa longline fleet. Numerous methods of permit allocation have been suggested (DMWR, 2001). Fishers were asked, "Do you feel that the number of longline vessels (big boats) in American Samoa needs to be limited? Why? What do you feel is the optimal number of vessels?" Twenty percent of the fishers had no opinion on limited entry. Ten percent felt the fishery would "take care of itself," meaning the profitable vessels would stay and those that were not would leave. The remaining 70% thought limited entry is a necessity for the fleet. Out of those 7 vessels, one felt that too many vessels offloading at the canneries would result in lower prices, 3 were concerned about potential overfishing, and 3 felt there would be gear conflicts with other big boats. There was no mention of potential gear conflicts with alias. According to the fishers who support implementation of a limited entry program, the average number of optimal vessels would be 37 (sd = 8).

Summary

The big-boat segment of the American Samoa longline fleet operated at an estimated annual cost of $479,857 per vessel in 2001. The estimated break-even point at the 2001 albacore price was 424,651 lbs, or approximately 9,437 albacore. Logbook information from 10 vessels indicates that these vessels are landing albacore at a higher rate (586,611 lbs or 13,036 fish) than necessary to meet expenses. Future revenue will be affected by cannery prices and the potential change in catch rates as this fishery matures. Future costs may also change if parts and services become more readily available, and the service and supply industry, on which the fishery depends, also matures.

Fishers indicated a need for some management to prevent overcapitalization of the fleet. The nearshore area closure has already gone into effect and fisheries managers are also considering limited entry, a device most of the interviewees supported. Development of an efficient system to export sashimi-grade tuna to foreign markets could significantly increase the profitability of the longline fleet.

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Prep Con II—Progress on MHLC Financing and Scientific Structure

John Sibert

The second Preparatory Conference for continued planning of the MHLC's Western and Central Pacific Fisheries Commission (WCPFC) was held in Papua New Guinea late in February 2002. It was preceded by a two-day "Informal Consultation" intended to help resolve issues that are particularly vexing to certain participants, and to devise a framework within which to promote participation by interested parties.

As expected, the Consultation and week-long Prep Con that followed were attended by most of the previous MHLC participants, again absent Japan. The other notable absence was French Polynesia, which did not participate because of concerns about overlap with the Inter-American Tropical Tuna Commission (IATTC).

Promoting Participation

The Consultation opened with statements from many delegations supporting the text of the Honolulu agreement, and making it clear that reopening the text is not negotiable. Representatives of Korea reiterated many of their concerns expressed in communications to the Prep Con Chair. Representatives of the European Union, OLDEPESCA (on behalf of some of its members), and the Russian Federation expressed their support for the convention and their desire to participate in both the Commission and the Prep Cons leading to it.

Discussion was focused on three specific areas: participation of legitimate fishing players; monitoring, control and surveillance (MCS); and, "duplicity," or duplication and overlap with the IATTC, the Commission for Conservation of Southern Bluefin Tuna (CCSBT), and the Indian Ocean Tuna Commission (IOTC).
These issues reflected concerns expressed by Korea, and were handled by small discussion groups with a special interest in the issues.

With respect to duplicity, it was agreed that formal arrangements with the IATTC and CCSBT could be handled by consultations amongst commissions, and by exchange of letters. The interim secretariat, working groups and representatives of the respective organizations will prepare these letters.

There was little resolution of the issues surrounding vessel monitoring systems, observers, and boarding, but the Chair's report reflects support for establishment of an MCS working group to begin to resolve these issues.

Finally, a procedure and set of criteria were established that could be used to evaluate requests for participation and judge whether a potential member is indeed a legitimate fishing player. This would appear to have paved the way for full European Community participation.

Complete details of the informal consultation can be found in "Report of the Chairman on the outcome of the informal consultations on agenda item XI: Mechanisms to promote participation," WCPFC/PrepCon/10, 25 February 2002.

Prep Con Membership Grows

Most of work of Prep Con II was conducted in informal sessions of the working groups established at Prep Con I, but critical decisions were taken in plenary session. Although it is not clearly reflected in meeting reports, the European Community was accorded standing as a full participant in the Prep Con. The Conference also responded to a request from the Russian Federation by allowing them "to addend to observe" the Prep Con (a status distinct from "observer").

Working Group I Elaborates Finance/Administration

Working Group I (WG.I) appears to have reached consensus on the general structure of the Commission, but there is considerable scope for more definition of this structure. The Commission will have an independent and adequately resourced secretariat, but some services may be out-sourced at market rates. More details of Commission structure will become clear as other working groups conduct their work and required services are more clearly articulated (e.g. scientific and MCS services). WG.I appeared to view science as a core function, and drafted an ambitious program of work to be undertaken at Prep Cons III and IV. Costs will be taken up fully in Prep Con III, and funding formulas will be established at Prep Con IV. The full report of WG.I is available as WCPFC/PrepCon/14, 25 February 2002.

Working Group II Envisions Science Protocol

WG.II had two primary tasks. Its first was to review the Convention to identify science needs, data requirements and coordination of research, and its second was to establish provisional mechanisms via which the Prep Con can receive scientific advice.

The Commission's Interim Secretariat greatly assisted the work of WG.II by letting a contract to MRAG Americas (a British consulting firm with offices in Florida) to review options for provision of scientific services to the Commission. The MRAG report extended the work of Ward et al. and very clearly described possible levels of scientific services that the Commission could implement.

The report also clearly emphasized that data collection and analysis, and stock assessment and related modeling, are absolutely essential core scientific activities of the Commission. The report identified possible levels of expertise in these two areas, ranging from a secretariat with virtually no internal expertise, for which all data collection and stock assessment are conducted by member countries (like the ICCAT), to a "self-sufficient" secretariat that collects all its own data and conducts its own stock assessments (like the IATTC). The MRAG report recommended a "preferred alternative" near the high end of expertise.

WG.II discussed these options extensively and appeared to favor a significant scientific capability within the secretariat, but was unable to reach consensus on either the appropriate level of expertise or on reporting relationships between the secretariat, the Scientific Committee (mandated by the Convention) and the Commission. Some of the concerns about the level of scientific expertise appeared to be motivated by cost considerations, by the

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role of existing regional organizations like the Secretariat of the Pacific Community (SPC), and by economic doctrine.

WG.II received presentations from the IATTC and the SPC's Ocean Fisheries Programme on the costs of scientific services. Both organizations indicated that the costs of providing data collection and stock assessment would be about US$2.5 million per year for the Commission.

The interim secretariat requested information on the status of stocks from the SPC/OFP, the IATTC, the SCTB, the Interim Scientific Committee of the MHLC and other national and regional bodies. The response was a substantial pile of documents that the interim secretariat was not qualified to interpret. WG.II recommended creation of a "Scientific Coordinating Group" to assist WG.II in carrying out those parts of its terms of reference that require special scientific and technical expertise. Meetings of the SCG are to occur in conjunction with the SCTB, and the first meeting is scheduled for July 29 and 30 in Honolulu (immediately following SCTB 15; see Upcoming Events on page 5).

Headquarters, Prep Con III and Reports

The Forum Fisheries Committee nominated the Federated States of Micronesia as its choice for location of the Commission Headquarters, and the Prep Con agreed on a set of criteria to guide selection of the headquarters site. Formal bids for the site must be lodged with the Chair of the Prep Con no later than September 1, 2002.

The third session of the Prep Con will be convened in Manila, Philippines, with provisional dates of November 18–22, 2002. Most of the working papers and reports from Prep Con II can be obtained from the web site maintained by the WCPFC interim secretariat (http://www.ocean-affairs.com/DocListing.html).

Conclusions

Most participants appeared to feel that Prep Con II made significant progress on most major issues. A substantial number of issues remain to be decided, but the path to these decisions is fairly clear. The final shape of the Western and Central Pacific Fisheries Commission will be established at Prep Con III later this year. Current participants left Madang fully committed to the WCPFC and the current text of the treaty. The absence of Japanese representation at the Conference was lamented, but the process is well under way and the WCPFC will be established with or without Japanese participation

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